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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,692	08/11/2003	HSIANG-LAN LUNG	10156-US-PA	1691

31561 7590 06/03/2008
JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER

WARREN, MATTHEW E

ART UNIT	PAPER NUMBER
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2815

NOTIFICATION DATE	DELIVERY MODE
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06/03/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USA@JCIPGROUP.COM.TW

Office Action Summary	Application No. 10/604,692	Applicant(s) LUNG ET AL.	
	Examiner Matthew E. Warren	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 May 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-6,8-12 and 35-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-6,8-12 and 35-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to the RCE and Amendment filed on May 6, 2008.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 4-6, 8-10, 12, and 35-37 are rejected under 35 U.S.C. 102(e) as being anticipated by Haspeslagh (US 6,580,120 B2).

In re claims 1 and 35, Haspeslagh shows (figs. 2h, 3, 5) split gate non-volatile memory comprising: a substrate; a charge-trapping layer (16 = 4, 5, 6) on the substrate; a split gate (7, 11) as a whole located over the charge-trapping layer, being part of one word line (word line W1 or W2) of a non-volatile memory array including the split-gate non-volatile memory cell; and a source/drain (14a, 13a) in the substrate beside the split gate; wherein the split gate includes at least two neighboring conductive pieces (7, 11) that are shorted with each other (W1, W2, W3, connect 7, 11, and 7 together in fig. 5) and have two opposite edge portions together causing, in operation of the memory cell a locally stronger electric field such that only one coding region ($br_{j,i-1}$) is defined (only

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one bit in layer 16), by the two neighboring conductive pieces, in the charge trapping layer around the two opposite edge portions.

In re claim 4, Haspeslagh shows (figs. 2h, 3, 5) the conductive pieces of the split gate include a pair of conductive spacers (7) and a conductive layer (11) between the pair of conductive spacers.

In re claim 5, Haspeslagh shows (figs. 2h, 3, 5) the pair of conductive spacers (7) are arranged with two substantially vertical sidewalls thereof adjacent to the source/drain (14a and 13a)

In re claim 6, Haspeslagh shows (figs. 2h, 3, 5) an insulator (12) on the source/drain, wherein the pair of conductive spacers (7) are disposed on the sidewalls of the insulator.

In re claim 8, Haspeslagh shows (figs. 2h, 3, 5) the conductive pieces (7,11) are separated from each other by a dielectric layer (17).

In re claim 9, Haspeslagh discloses (col. 6, lines 39-47) that the split gate comprises polysilicon.

In re claim 10, Haspeslagh discloses (col. 6, line 59 – col. 7, line 27), the charge-trapping layer (16) comprises a silicon nitride layer (5) disposed between two silicon oxide layers (4, 6).

With regards to remaining limitations of claim 35, and claims 36-37, the claimed "programming operation" is not considered to add any structure to the claimed device and is considered to be intended use of the device. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed

does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Masham, 2 USPQ2d 1647 (1987).

In re claim 12, Haspeslagh discloses (col. 6, lines 4-26) that the substrate comprises a p-substrate, and the source/drain comprises an n-type source/drain.

Claim 11 is rejected under 35 USC § 103 (a) as being unpatentable over Haspeslagh (US 6,580,120 B2) applied to claim 1 above, and further in view of Schwabe et al. (US 4,257,832).

In re claim 11, Haspeslagh does not show the charge-trapping layer comprising aluminum oxide (Al_2O_3). Schwabe discloses in col. 3, lines 11-15 a charge-trapping layer comprises aluminum oxide (Al_2O_3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the trapping layer of Haspeslagh by using Al_2O_3 as a tunnel oxide taught by Schwabe to form a suitable charge trapping layer.

Response to Arguments

Applicant's arguments filed with respect to the amended claims have been fully considered but they are not persuasive. The applicant primarily asserts that Haspeslagh does not show all of the elements of the claims such as the amended limitation of the split gate, as a whole located over the charge-trapping layer, being part of one word line of a non-volatile memory array including the split-gate non-volatile memory cell. The examiner believes that the prior art shows all of the elements of the claims. Upon further

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review of Haspeslagh, the examiner has concluded that Haspeslagh does in fact teach at least the amended limitations of the claims. The claims only require that the split gate as a whole is part of one word line. If one were to consider the first two gates (left side 7, 11) as a whole split gate, then the split gate is connected to one word line W1 or W2. If one were to consider all the gates of the split gate as a whole, then Haspeslagh's device still satisfies the requirements of the claims since the split gate is a part of one word line (any of word lines W1-W9). Therefore, Haspeslagh shows all of the elements of the claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew E. Warren whose telephone number is (571) 272-1737. The examiner can normally be reached on Mon-Thur and alternating Fri 9:00-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on (571) 272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matthew E Warren/
Primary Examiner, Art Unit 2815

May 27, 2008